Solid Tumor Fact Sheet

CIRM funds many projects seeking to better understand solid tumors and to translate those discoveries into new therapies.

Description

Solid tumors include cancers of the brain, ovary, breast, colon and other tissues. Many people believe that one quality solid tumors share is a reliance on cancer stem cells. These cancer stem cells are thought to divide to produce the bulk of the cells that make up the tumor.

The hypothesis suggests that unlike most cells of a tumor, the cancer stem cells divide very slowly and are less likely to be destroyed by chemotherapies that kill the fast-growing tumor cells. The thought is that cancers might recur because the chemotherapy kills the bulk of the tumor, but leaves behind the cancer stem cells that can, over time, form a new tumor.

Stem cell scientists are studying cancer stem cells from solid tumors in the lab to find ways of destroying them. If these cancer stem cells share characteristics that allow them to be destroyed by the same drug, then a single new drug could significantly improve cancer treatment for a range of different cancer types.

Clinical Stage Programs

Stanford University

The Stanford University team has found a protein on the surface of leukemia stem cells that protects those cells from elimination by the patient's own immune system. They call this protein a "don't eat me" signal. They will create an antibody therapy that blocks that protein and makes the cancer stem cell available to be attacked and destroyed by the immune system.

- Read a summary of this project

Forty Seven Inc.

This company is using the same antibody therapy as in the Stanford trial, this time to fight colorectal or bowel cancer. They are combining their antibody therapy with another antibody-based cancer drug called Cetuximab in hopes of treating patients with colorectal cancer.

- Read a summary of this project

University of California, Los Angeles

A team led by scientists at UCLA has identified several potential drugs that kill cancer stem cells from the ovary, colon and brain in the lab dish. They will continue studying these drugs to find one that is most likely to be safe and effective at destroying cancer stem cells in people. Once they've identified the best candidate drug, the team plans to start clinical trials.

- Read a summary of this project

Participant in UCLA clinical trial talks about his cancer diagnosis and his clinical trial experience

CIRM Grants Targeting Solid Tumors

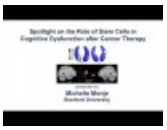
Researcher name	Institution	Grant Title	Grant Type	Approved funds
Mark Chao	Forty Seven Inc.	A Phase 1b/2 Trial of the Anti-CD47 Antibody Hu5F9-G4 in Combination with Cetuximab in Patients with Solid Tumors and Advanced Colorectal Cancer	Clinical Trial Stage Projects	$10,234,048
Dan Kaufman	University of California, San Diego	Targeted off-the-shelf immunotherapy to treat refractory cancers	Quest - Discovery Stage Research Projects	$1,936,936
Julia Unternaehrer-Hamm		Targeting cancer stem cells with nanoparticle RNAi delivery to prevent recurrence and metastasis of ovarian cancer	Inception - Discovery Stage Research Projects	$172,870
Julien Sage	Stanford University	The retinoblastoma (RB) gene family in cellular reprogramming	Basic Biology I	$1,357,085
Dennis Slamon	University of California, Los Angeles	Therapeutic Opportunities To Target Tumor Initiating Cells in Solid Tumors	Disease Team Research I	$19,979,660
Irving Weissman	Stanford University	Development of Therapeutic Antibodies Targeting Human Acute Myeloid Leukemia Stem Cells	Disease Team Research I	$18,759,276
Elizabeth Lawlor	Children's Hospital of Los Angeles	hESC as tools to investigate the neural crest origin of Ewing's sarcoma	SEED Grant	$595,576
Siavash Kurdistani	University of California, Los Angeles	Epigenetics in cancer stem cell initiation and clinical outcome prediction	New Faculty I	$3,063,450
Irving Weissman	Stanford University	Clinical Investigation of a Humanized Anti-CD47 Antibody in Targeting Cancer Stem Cells in Hematologic Malignancies and Solid Tumors	Disease Team Therapy Development III	$6,505,568
Dennis Slamon	University of California, Los Angeles	A Phase I dose escalation and expansion clinical trial of the novel first-in-class Polo-like Kinase 4 (PLK4) inhibitor, CFI-400945 in patients with advanced solid tumors	Disease Team Therapy Development III	$6,924,317

David Cheresh	University of California, San Diego	CD61-driven stemness program in epithelial cancer	Basic Biology V	$1,161,000	
John Zaia	City of Hope	The Innovation-Alpha Clinic for Cellular Therapies (I-ACT) – A Program for the Development and Delivery of Innovative Cell-based Treatments and Cures for Life-threatening Diseases.	Alpha Stem Cell Clinics	$8,000,000	
Mark Walters	Children's Hospital of Oakland Research Institute	University of California, San Francisco (UCSF) CIRM Alpha Stem Cell Clinic	Alpha Stem Cell Clinics Network Expansion	$7,999,999	
					Total: $86,689,785.00

CIRM Cancer Stem Cell Videos

CURED: Stem Cell Clinical Trial Stories

UCLA Clinical Trial Targets Cancer Stem Cells: A Patient's Story



Role of Stem Cells on Cognitive Dysfunction after Cancer Therapy

Stem Cell Therapies for Leukemia: Marching Toward the Clinic

Andrew Goldstein, UCLA - CIRM Stem Cell #SciencePitch

Michael Rothenberg, Stanford - CIRM Stem Cell #SciencePitch

Anica Sayoc, City of Hope - CIRM Stem Cell #SciencePitch

Catriona Jamieson, UCSD - CIRM Stem Cell #SciencePitch

Paul Knoepfler, UC Davis - CIRM Stem Cell #SciencePitch

Amy Sprowles, Humboldt State University - CIRM Stem Cell #SciencePitch

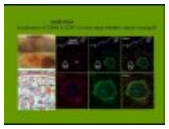
Yi Eve Sun, UCLA - CIRM Stem Cell #SciencePitch 2

Irving Weissman, Stanford - CIRM Stem Cell #SciencePitch

Brain Tumors: Advancing Stem Cell Therapies - 2011 CIRM Grantee Meeting

Leukemia: Advancing Stem Cell Therapies - 2011 CIRM Grantee Meeting

Spotlight on Cancer Stem Cells



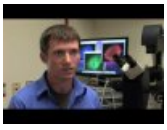
Spotlight on Basic Research: Irv Weissman

Spotlight on Leukemia: Welcoming Remarks

Spolight on Leukemia: Catriona Jamieson, M.D.

Spotlight on Leukemia: Clinical Trial Participants

Progress and Promise in Leukemia



Genetic Molecule Enables Safer Method For Creating iPS Cells

Catriona Jamieson Talks About Therapies Based on Cancer Stem Cells

News about solid tumor research

- Bad Seeds: Cancer's Ultimate Source (Stanford Medicine)
- The True Seeds of Cancer (Stanford Medicine)
- CIRMResearch Blog entries about cancer stem cell research

Resources

- NIH: Cancer Information Service

- National Cancer Institute
- American Cancer Society
- Stem Cell Netword solid tumor page
- Ovarian Cancer National Alliance
- American Association for Cancer Research
- Family Caregiver Alliance
- National Family Caregivers Association

Find Out More:
Stem Cell FAQ | Stem Cell Videos | What We Fund

Source URL: https://www.cirm.ca.gov/our-progress/disease-information/solid-tumor-fact-sheet